GUIDE TO:

ENERGY PERFORMANCE CONTRACTING

PREPARED BY:

SOUTH CAROLINA ENERGY OFFICE

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1. INTRODUCTION

1.1 About This Guide

The South Carolina Energy Office (SCEO) of the South Carolina Budget and Control Board (BCB) has prepared this Guide to help state agencies, school districts and other entities improve their buildings using the money saved by reducing energy costs to pay for the improvements. A part of what is normally paid to the utility company is saved and this savings is used to pay for better equipment, better controls, better maintenance, etc. "Energy Performance Contracting (aka: Performance Contracting)," as this approach is commonly known, provides agencies and districts with a way to fund energy-saving improvements even when budgets are tight.

In this Guide, SCEO provides an introduction to Energy Performance Contracting and a reference manual to help agencies and districts through the process. Chapters 1 and 2 introduce the common features of Performance Contracting, a simple feasibility evaluation, and advice on getting a project started. Chapter 3 describes in detail the Energy Service Company (ESCO) selection process. Chapter 4 provides a description of the actual performance contract. Chapter 5 addresses how to measure energy savings and gives advice on project monitoring and management to insure a successful project.

1.2 What Is Energy Performance Contracting?

Energy Performance Contracting is an innovative method for purchasing energy-saving improvements in buildings. Many state agencies and school districts face increasing energy costs and the need to replace worn-out equipment, but lack the funds to make building improvements. Energy performance contracting has three distinguishing features that address this and other common problems:

1. A single procurement is used to purchase a complete package of services in which one contractor (ESCO) is accountable for design, purchase, installation, maintenance, and operation of the equipment to ensure optimum performance;

2. The package of services includes financing of all the project costs, so *no up-front money is needed*; and

3. An energy performance contract is structured so that payments to the ESCO are contingent on the actual level of savings achieved (or energy produced). Normally, the savings produced by the project are greater than its cost. A performance contract pays for itself. Since payments to the ESCO are contingent on the savings achieved, it is in the contractor's interest to maximize the energy savings. This translates into increased dollar savings for facility owners.

1.3 How Is Energy Performance Contracting Different?

1.3.1 Conventional Contracting

A conventional process to purchase energy-efficiency improvements often requires four separate solicitations and contract awards. First, a facility owner solicits engineering services for an energy study. After reviewing the completed study, the facility owner selects the improvements to be implemented and solicits proposals for engineering design services. Once the designer completes a plan and specifications, the owner issues one or more invitations to bid to select contractors who will install the improvements. Finally, the facility invites bids to request preventive maintenance services for any equipment the facility is not maintaining with in-house staff.

1.3.2 Energy Performance Contracting

Energy performance contracts replace this cumbersome collection of solicitations and contracts with a single proposal covering all aspects of the project and one contract with the selected proposer. The process begins with an evaluation of a facility's potential for efficiency improvements by the facility staff. If the potential seems promising, the agency or district prepares a Request for Qualifications (RFQ). The RFQ's purpose is to select a short list (no more than three) of Energy Service Companies (ESCO) to prepare competing proposals for the final selection of energy efficiency equipment and services to the state agency or school district. Once selected, the ESCO prepares a proposal which includes a detailed study[1] of energy efficiency opportunities at the facility. Said proposals become the basis for a contract between the state agency or school district and the ESCO. After receipt of a favorable proposal, the agency or district awards the contract to the ESCO who is accountable for all services and guarantees a level of savings to the facility.

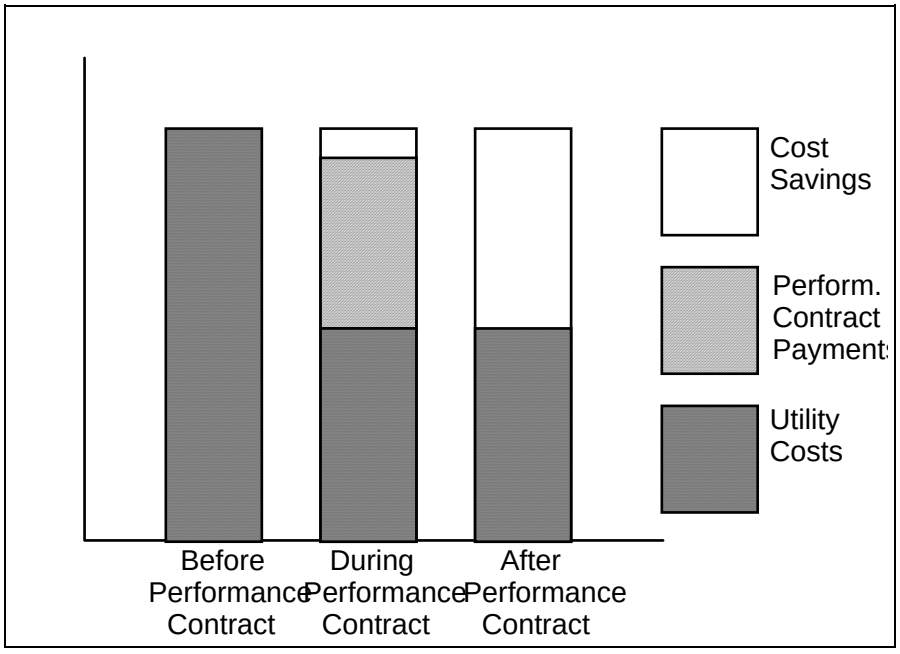
The ESCO then prepares plans and specifications that the facility staff (and State Engineer or Office of School Facilities, as appropriate) also review and approve. After receiving the notice to proceed, the contractor furnishes, installs, and commissions the efficiency improvements and begins performing maintenance and repairs that continue for the duration of the contract term. Facility staff monitor the day-to-day performance of the ESCO during the construction process in the same manner that they would for a large repair and maintenance project. After construction is completed and accepted, facility staff monitor ESCO performance concerning equipment maintenance and repair, standards of service and comfort, and level of energy savings achieved.

[1] The cost of the energy study is included in the work financed by the performance contractor. However, after the study is completed, the facility may choose to install the upgrades on its own or not to proceed at all. If the facility chooses not to use the performance contractor to complete the project, the facility may be obligated to pay for the preparation of the energy study.

1.4 Benefits of Energy Performance Contracting

Energy Performance Contracting offers a number of important benefits. First and foremost, it allows agencies or districts to go ahead with projects that tight budgets would otherwise prevent. The ESCO finances all of the project costs, including up-front engineering, construction, and maintenance services, allowing projects to proceed without capital improvement or repair funds. The agency or district receives new and improved lighting, cooling, and other equipment and the cost of this equipment is offset by reduced utility bills. After the equipment cost has been paid off, the agency or district owns the equipment and retains all of the savings from reduced utility bills. Even if the payments to the performance contractor offset much of the energy savings in the short run, upgrading equipment allows all of the non-energy benefits, such as improved comfort and reliability, to be realized immediately.

Figure 1-1: Energy Performance Contract Cost Savings



Energy Performance Contracting streamlines the purchasing process for energy efficiency projects, reducing the cost and time required to bring energy-saving projects on line. A single company takes responsibility for designing, building, financing, and maintaining all necessary improvements. The ESCO often employs a team of consultants and subcontractors to accomplish this but one company is still accountable for the ultimate success of the project. This single-source accountability makes the project easier to manage than a conventional construction project. Streamlining the procurement process in this way makes it possible for facilities to implement more comprehensive projects, reduces the time and cost to manage projects, and gives on-site facility staff and

users the opportunity for more input into the project design and better control of the final product. As a result, efficiency improvements acquired through performance contracts often work better, last longer, and enjoy stronger long-term support from facility administrators, maintenance staff, and building users than other energy efficiency projects.

Energy Performance Contracting, as its name implies, shifts much of the risk associated with an energy efficiency project from the agency or district to the ESCO.

1.5 Pitfalls of Energy Performance Contracting

The pitfalls of implementing and Energy Performance Contract are well documented. Although the concept and process are proven, some contracts are too heavily weighted in the direction of the contractor. Since most contractors are experienced in this business and, in fact do it for a living, their advantage over the client, who generally does this only once, is considerable.

The Facility Owner should seek assistance from an appropriate source, whether it is required through the Office of the State Engineer (OSE), the Office of School Facilities or available through the State Energy Office. Particular areas to explore are:

- Energy Baseline Development

It is crucial that the facility owner participate in establishing the energy baseline, instead of the contractor establishing the baseline on his own.

- Energy Baseline Adjustment

It is also important the facility owner agree on the definitions and methodology for making any future adjustments to the energy baseline. This should be a part of the contract.

- Operational Savings

Operational savings include those savings that are not derived from energy reduction. They can be labor or material savings that result from the implementation of a particular energy conservation measure. For instance, if a school has new lights installed in all classrooms, no labor or materials will be necessary in these areas for replacing lamps or ballast for some time. In some cases, especially in the claim of labor, the savings may never be realized unless a staff position is eliminated. The allowance of operational savings is generally discouraged.

- Stipulated Savings

Savings, not measured, that are established in the contract (often lighting changeouts) are usually to the contractor's advantage. Usually, run times and published efficiencies of equipment are set and may not actually occur. Stipulated savings should be used minimally.

- Excessive Finance Charges

There have been instances where ESCOs inflated the interest rate on the funds borrowed to generate additional profits. Facility owners should check the rates against local banks or other national institutions to make sure they are competitive. Facility owners may be able to arrange their own financing at lower rates.

- Required Maintenance Agreements

Some ESCOs have required that the preventive maintenance on facilities also be outsourced to that ESCO. As such, they tie the maintenance agreement to the guarantee agreement. These maintenance agreements may be very expensive in relation to the value of services provided and can provide a major source of profit to the contractor.

- Lack of Local Facilities Control

There have been occasions where the contractors have required off-site control (often out of state) of the buildings, requiring telephone calls to change schedules and remote sensing and control in the hands of control center. While this practice has become rare with improved computer technology, it must be avoided.

- Terms of Savings Reconciliation Versus Budget Cycle

Some standard ESCO performance contracts are written to allow the contractor to carry over savings that occur in early years to offset losses in later years. Savings should be calculated on an annual basis and stand alone on that basis.

- Quality Control

Very little is more important than a solid contract, rigidly enforced. The use of a project manager or a third party verifier by the client is highly recommended.

1.6 What Kinds of Equipment and Services Can Be Purchased?

Energy-savings performance contracts are used to purchase a wide variety of building equipment and services. Energy-efficient lighting, air conditioning systems, energy management control systems, motor replacements, and variable-speed drives for pumps and fans are commonly implemented improvements. Generally, an ESCO will include any improvement expected to recover its own cost (including maintenance and interest expense) in energy savings over the term of the agreement. This means that longer payback items, such as adding ceiling insulation or replacing windows, usually do not qualify unless they are bundled with fast payback items.

In addition to equipment installation, the ESCO may propose various repair and maintenance services. Often contractors propose repairs to existing systems, such as re-installation of damaged or missing controls or repair of leaks in chilled water piping. Generally the ESCO assumes responsibility for preventive maintenance and repairs to all new equipment installed. The ESCO may also offer to take responsibility for maintenance and even operation of existing equipment. For example, the ESCO may offer to provide remote monitoring and adjustment of temperature setpoints with a computerized temperature control system.

Because any equipment installed is ultimately owned by the facility, the ESCO also provides documentation for all installed equipment, including as-built drawings and operating manuals. The ESCO also trains the on-site facility staff to operate and maintain the equipment. In some cases, ESCO's even pay the costs to have facility personnel attend training programs provided by equipment manufacturers.

1.7 Energy Performance Contracting in South Carolina

The South Carolina Energy Conservation and Efficiency Act of 1992 authorizes the use of guaranteed energy savings contacts by governmental units. A key provision is that the contract must include a written guarantee that savings will meet or exceed the cost of energy conservation measures. Refer to South Carolina Code of Laws, Section 48-52-670, for the complete provisions.

Guaranteed energy savings contracts are also referenced in South Carolina Code of Laws, Section 11-27-110, concerning the constitutional debt limit of governmental units. Payments on these contracts are exempted from some of the debt limit provisions that apply to other types of financing agreements.

It is important to understand that local governments and school districts have specific requirements and administrative rules and regulations they must follow. For example, energy efficiency measures installed at school districts under an energy performance contract must be approved by the Office of School Facilities of the S.C. Department of Education prior to the installation. Further, any vendor that has executed an energy performance contract with a school district for heating, ventilating or air conditioning system modifications or replacements, replacement or modification of lighting and/or electrical systems, energy recovery systems, and/or measures that are affected by any applicable codes, shall submit complete drawings and specifications to that office. These documents must include the professional seal of an Architect and/or Engineer licensed to practice in South Carolina. This same licensed professional shall notify OSF of the installation of the aforementioned measures to give OSF the option to inspect the installed measures in the field. School districts must also make certain the lighting levels required by the *South Carolina School Facilities Planning and Construction Guide* are met.

While the *Guide* will prove informative for facility managers at state agencies, all state agencies, colleges and universities must follow the *Manual for Planning and Execution of State Permanent Improvements, Part II* issued by the State Engineers Office.

In South Carolina, the Energy Office of the South Carolina Budget and Control Board provides assistance to state agencies and school districts to obtain the benefits of performance contracting.

2. PRELIMINARY WORK

2.1 A Preliminary Feasibility Analysis

2.2 In-depth Feasibility Analysis

2.3 Organize a Project Team

2.4 Win Management Support

2.5 Gather Facility Information

2. PRELIMINARY WORK

Facility managers usually consider Energy Performance Contracting because they have an immediate problem but lack funds to solve it. Often the problem is simply that utility costs are rising faster than budgets. Sometimes the problem is that existing equipment is worn out and needs to be replaced but replacement funds are not available.

Before undertaking an energy performance contract, facility staff should evaluate whether it is likely to solve their problems. A feasibility evaluation can be as simple or sophisticated as a person wants to make it. This section outlines a very simple method based on common rules of thumb. Section 2.2 and Appendix B, Feasibility Analysis, describe a more sophisticated method, including available software tools.

2.1 A Simplified Feasibility Analysis

To determine the feasibility of an energy performance contract, a general rule of thumb is that a facility must have energy-saving opportunities meeting the following two conditions:

- The energy-saving opportunities must add up to a project investment of at least $50,000; and
- The opportunities must have a simple pay-back period of five years or less for equipment. (Does not account for such items as financing, ESCO fees, among others)

If an energy study has already identified a project meeting these criteria, then no further evaluation is necessary. Table 2-1 can be used to evaluate feasibility based on readily available information and rules of thumb developed within the Performance Contracting industry. Facility managers who want to perform a more sophisticated analysis should refer to Appendix B, Feasibility Analysis.

Table 2-1: Performance Contracting Feasibility

	Yes	No
1. Does your facility spend less than $100,000 a year on energy?		
2. Has a large-scale lighting efficiency upgrade *already been completed* in your facility?		
3. Is a significant part (more than 20%) of your facility scheduled for closure or major remodeling within the next five years?		
4. Has a recent energy audit of your facility failed to identify any significant energy-saving opportunities?		

If you answer YES to any of these questions, your facility may not be a good candidate for Performance Contracting. In this case, several options are available.

If you answered YES to question number 1 (energy costs are less than $100,000 per year) consider combining several facilities to make a larger project. If you answered YES to question number 2, 3, or 4, consider contacting potential qualifiers directly, describe your facility, and ask whether they would submit qualifications if an RFQ is issued. You may also wish to contact SCEO for assistance.

2.2 In-depth Feasibility Analysis

Performance contracts, like other large construction projects, require the support and participation of many people for successful completion. A more sophisticated evaluation helps win invaluable support for the project from maintenance staff, administrators, and building users. In addition, knowledge gained during a careful energy analysis can strengthen the facility's position in future discussions with potential qualifiers.

Performing an in-depth analysis of existing conditions and energy-saving opportunities at the facility offers the following benefits:

- Low- and no-cost energy saving opportunities are often discovered which can be implemented immediately;
- Facility staff will have a better understanding of existing conditions and be better prepared to negotiate the energy savings baseline;
- Facility staff will be better prepared to suggest possible energy-saving improvements to potential qualifiers; and
- Facility staff will be better prepared to evaluate proposed efficiency measures, technical approaches, and costs.

Due to the specialized technical expertise required for an in-depth study of cooling efficiency improvements, most facilities focus their attention on lighting energy savings first. Software for lighting efficiency analysis is available that makes sophisticated analysis of lighting opportunities relatively easy. Appendix B provides further directions for an in-depth feasibility analysis, including information on software tools.

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2.3 Organize a Project Team

Managing an energy performance contract requires the participation of experts from several departments, including facilities planning, procurement, budget and finance, and legal. To meet this need, we recommend forming a project team early in the process. The project team will need diverse kinds of expertise, including:

- Technical expertise to evaluate energy efficiency potential, develop a scope of work, and evaluate ESCO proposals and work;

- Procurement expertise to ensure that the process follows applicable procurement rules during the Request for Qualifications, Proposal Specifications and contract award;
- Knowledge of budget and finance procedures to establish a method to budget and make payments for the duration of the contract; and
- Legal expertise to review all contract terms and (possibly) assist in discussions with the proposer before contract award.

To organize a project team, first identify a project manager who will have overall responsibility for coordinating the team members and overseeing the work performed by the ESCO. Most agencies or districts choose their Director of Administrative Services (that is, facility manager) to be the project manager. For large projects, a more time-dedicated person may be required.

The project manager should recruit people expert in each of the areas listed above early in the development of the project. During the early stages of the project, it may be appropriate to simply provide team members with general information about Energy Performance Contracting and the project status. Holding an introductory briefing and providing copies of this Guide to all team members makes a good beginning. The purpose of this introductory meeting is to:

- Explain the concept of Energy Performance Contracting to all project team members;
- Build support for the project by describing facility needs that Energy Performance Contracting will meet and the benefits expected to result from the project; and
- Describe the process and the intended schedule for each step so that the team members know what to expect.

Many of these project team members may be logical choices for an evaluation committee when the project reaches the point of contractor selection.

2.4 Win Management Support

Winning management support is another activity that must begin as early as possible in the Performance Contracting process. In order to win support, you will need to persuade key administrators of the value that Performance Contracting offers the facility. In addition to explaining how an energy performance contract works, questions that you can answer to help win support include:

- What facility needs will a performance contract meet? Needs might include replacing worn-out equipment, reducing energy costs, or improving comfort;
- Is it likely that improvements will be made without an energy performance contract? What funds will be used?
- Could these funds be used for other projects?

Many public officials work hard to win the support of facility users as well as managers. Educating facility users about a project's benefits makes them more willing to cooperate during the installation process and means fewer headaches for administrators and facility personnel.

2.5 Gather Facility Information

If you have not already done it as part of your feasibility analysis, another step in getting started is to gather information about your facility. Appendix A lists information to collect which you will need to prepare Proposal Specifications.

3. SELECTION PROCESS

3.1 Purpose and Scope of RFQ/RFP

3.2 RFQ Selection Process

3.3 Final Selection Process

III. SELECTION PROCESS

3.1 Purpose and Scope of RFQ

The purpose of the RFQ process is to select one ESCO to prepare a Performance Contracting proposal for the provision of energy efficiency equipment and services to the state agency or school district. The proposal will be the basis for an agreement between the state agency or school district and the ESCO. Under the agreement the selected ESCO will:

- Provide comprehensive energy services for the state agency's or school district's building, including the: (a) performance of engineering studies; (b) design, selection and installation of energy efficient equipment and systems; (c) maintenance and servicing of the installed measures; (d) securing of financing for the transaction; and (e) energy management training of selected state agency and school district employees.
- Structure the terms of the state agency or school district's payment of obligations for equipment and services on a Performance Contracting basis. Under a Performance Contracting agreement: (a) the ESCO will guarantee that equipment and services will achieve a predicted level of energy and operational savings; (b) the state agency or school district will realize equipment and services without the requirement of capital funding; and (c) the state agency or school district will be able to meet its payment obligations (or a predetermined percentage of payment obligations) through guaranteed energy and operational savings.

3.2 RFQ Selection Process

The RFQ is part of a selection process leading to a performance contract for energy efficiency equipment and services between the state agency or school district and an ESCO. Steps in the process for a state agency and a school district are described below:

1. After determining the positive potential of a performance contract, the state agency or school district advertises the RFQ to prospective ESCOs. At this point, agencies will have the involvement of the Office of State Engineer. School Districts may seek assistance from the Office of School Facilities. The S.C. Energy Office is available to all.

2. Interested ESCOs submit a Statement of Qualifications. These are evaluated by the selection committee and reduced to a final selection of no more than three contractors. The project manager of the facility should be leading this phase and should have on board any consultants who might assist with the contracting. attended the required conference.

At this point, a set of criteria for evaluation should be developed by the client, with different categories of importance, each weighted appropriately. A solid set of values for selection should be established at this point and at the point of final selection to provide solid reasoning for award of the contract. This will help to avoid conflict, misunderstanding and appeals

The Statement of Qualifications may be required to include:

Qualifications of Contractor

Qualifications of Staff

Experience with similar projects

Ability to perform, including:

Project management, project responsiveness and training responsiveness.

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3.3 Final Selection Process

Once the client has determined the short list of best qualified contractors for his project, a more comprehensive and specific proposal is required.

1. The short-listed finalists are then required to each submit a preliminary energy study. These studies will include those areas specified to be addressed by the facility owner as well as other opportunities derived by the contractors. The owner must level the playing field by providing specific hours of operation for classes of buildings to include run times of lighting and comfort conditioning. Eliminate the opportunities to be misunderstood or to inflate operating times to the advantage of certain equipment.

   Evaluate the studies to determine that there is, indeed, a benefit to the owner to proceed. Up until now, no costs should be incurred by the owner and there is no contractual obligation to continue. If there is benefit to be realized, then continue.

2. The preliminary energy study will be a detailed working proposal based upon the expressed needs of the facility owner and the individual initiative of the contractor, unless constrained to the owner's specific lists. As a minimum, it should include:

   ESCO and Subcontractor Information, to include any modification to the original Statement of Qualifications.

   Project Description – with lists and justifications, (costs and paybacks) of energy efficiency measures to be performed and their timetables; standards of facility comfort (heating and cooling, hot water setpoints, ventilation levels and lighting levels) and specific numbers of items, especially lighting, to be installed.

Maintenance Services and Warranties, including relationship to existing maintenance and preventive maintenance on new equipment.

Training Services, to include a list of those personnel who are to receive training, their level of training, the times of training in the course of the project and the expected capability of each person following training.

Project Cost Summary for each category of project, training, maintenance and cost of energy study.

Project Financing, including the amount that will be financed, the financing method, source of financing and interest rate.

Guaranteed Energy Savings, as estimated in KWH, demand charges, therms, gallons.

Operational Savings (if any) described precisely for each item listed, with a description of how operational savings are guaranteed.

Cash Flow Statements separated into energy cost savings, energy plus operational savings (if any), using estimated interest rates. All assumptions of interest rates and energy cost changes should be thoroughly explained.

Project Summary

Official ESCO Statements to confirm that the contractor will conform with any stated terms or provisions or a statement of conflict and alternate proposal.

Additional Information to assure that the contractor meets any bonding and insurance requirements, plus any other information.

3. Each member of the Evaluation Committee will independently reach a cumulative score for the preliminary energy studies by assigning scores to individual sections according to an established criteria and adding the section scores.

   Based on its scoring and ranking, the Evaluation Committee will recommend one ESCO to the owner. If the owner/agency approves the Evaluation Committee recommendation, it will instruct the selected ESCO to prepare a detailed facility survey. An amount for the detailed survey should be contracted at this time.

4. The ESCO will complete the detailed study. It must be emphasized that the final costs and savings in this study must be *at least* as beneficial to the client as were

   the costs and benefits derived in the preliminary study. If the final study, after complete review, is determined to be beneficial to the client and is a project considered worthwhile to pursue, the next phase is entered. If the venture is not

considered a viable project, the contractor will be reimbursed for the final study and the study should remain the property of the client.

4. PREPARING AN ENERGY PERFORMANCE CONTRACT

4.1 Contract Development

4.2 Key Issues to Address in a Performance Contract

4. PREPARING AN ENERGY PERFORMANCE CONTRACT

THIS CHAPTER DESCRIBES GENERIC TERMS AND PROVIDES SAMPLE MATERIALS RELATING TO ENERGY PERFORMANCE CONTRACTS. BECAUSE SPECIFIC PROJECT AND AGENCY/DISTRICTS REQUIREMENTS MAY VARY SIGNIFICANTLY, THESE MATERIALS SHOULD NOT BE INTERPRETED AS LEGAL ADVICE RELATING TO ANY SPECIFIC SOLICITATION OR PROJECT. EACH PUBLIC AGENCY AND DISTRICT SHOULD CONSULT ITS OWN LEGAL ADVISORS BEFORE SOLICITING OR ENTERING INTO ANY ENERGY PERFORMANCE CONTRACT.

Performance contracts usually affect capital equipment essential to the facility's mission and can easily involve total investments in the millions. The contract establishes a long-term relationship between the facility and contractor, and agencies or districts should develop terms to address potential issues with great care. The ultimate goal of the contracting process is to reach an agreement that is equitable to both parties, protects the interests of the facility, and is so clear that any third parties reading it will interpret it the same way.

4.1 Contract Development

Development of the contract between the ESCO and the client is the next very crucial step. State agencies will use the contract developed by the Office of the State Engineer and the final document will be reviewed by that office. This contract form is available to school districts and other entities upon request. Use of this form may remove the inherent advantage to the ESCO that may be found in his standard contract. If the contractor's contract is used, the client has the right to modify the document until both sides are satisfied.

4.2 Key Issues to Address in a Performance Contract

The following paragraphs list key issues to consider in developing a performance contract.

4.2.1 Contractor's Services (Scope of Work)

As in any contract, the scope of work that the contractor is responsible to complete must be described clearly and completely. In a performance contract, the contractor may be performing services in several different areas. Common services include:

- Engineering and design services;
- Construction services (including any licenses and permits required);
- Operations and maintenance services (including preventive maintenance, repairs, and emergency service); and
- Training services (to ensure facility staff can operate equipment).

The contractor is usually responsible for all equipment repair and scheduled maintenance. In some cases using on-site facility personnel to perform some maintenance may reduce costs. Usually the on-site personnel retain most operating responsibilities.

In the sample contract, contractor's services are addressed in Article 3 of the contract and in General Provisions 6, 7, 8, 9, 10, 11, and 19.

4.2.2 Facility Owner Responsibilities

Generally, the efficiency improvements installed by the contractor depend on certain actions by the facility in order to achieve savings. The facility owner must make sure that the contract describes its obligations very clearly. This ensures that the facility owner understands its commitment and prevents the contractor from unreasonably claiming that savings were not achieved due to omissions by the facility owner. Facility responsibilities may include operating or maintaining existing equipment in a way that helps the contractor's improvements to achieve savings. For example, if the contractor proposes energy management controls for an existing air conditioning system, the contractor may ask the facility to maintain the system to an agreed standard.

4.2.3 Compensation

The contract must establish what price will be paid for the contractor's services, the timing of payments, and how payments will be calculated. The Energy Study Report includes a calculation of the final price.

4.2.4 Term

The contract must state the term of the agreement and under what circumstances it may be terminated. Possible reasons for early termination include failure to appropriate sufficient funds for the continuation of the contract, or default.

4.2.5 Ownership of Equipment

The contract should make clear who owns the equipment installed by the contractor at all times during the contract. Equipment ownership may be important to the contractor for purposes of securing financing or for the tax treatment of the contractor's revenues under the performance contract. Specific language could include that all equipment installed by the contractor remains the property of the contractor during the term and ownership transfers to the agency at the expiration of the contract. The agency or district should consult its attorney should the proposer wish to alter this provision.

In cases where the contractor's equipment includes software, the agency or district should ensure that it receives a license, both during the contract term and perpetually afterwards, to use the software to the extent necessary to operate facility equipment.

4.2.6 Standards of Service and Comfort

One inappropriate way a contractor could increase savings might be to reduce the amount of cooling or lighting below the levels customarily provided in the facility. In order to

prevent this, the contract must establish what levels of cooling and lighting are considered acceptable and require the contractor to design, install, and maintain equipment to provide these levels. Specific language should include standards of service and comfort, including space temperature, humidity, outside air ventilation, and light levels. Facilities owners should carefully consider any special service standards (such as. computer rooms and laboratories) and ensure that they are included in general or special provisions.

4.2.7 Savings Measurement

In a performance contract, savings measurement is a vital issue. Generally, the improvements to be installed must be known before the most appropriate savings measurement method can be selected. Therefore, the contract requires the contractor to provide a detailed savings measurement plan, including the method for establishing the energy baseline, in the Energy Study Report. Facilities should scrutinize the measurement plan with great care before accepting the Study Report for incorporation into the contract.

Material Changes and Baseline Modifications

An issue related to savings measurement is what to do if the operation or equipment of the facility changes, making the original energy baseline unrepresentative of the actual operation. Generally, contracts provide that when the facility changes in a way that affects the project energy savings significantly, the baseline may be modified.

4.2.8 Risk Management

The contract should include typical language to protect the agency or district from any damages or liability that may arise due to the contractor's performance or non-performance under the contract. Facility owners should not accept a disclaimer saying that the ESCO shall not be responsible for any indirect, incidental, or consequential damages arising from the work. If such change is suggested, the facility owner should contact its attorney for assistance.

The ESCO should be required to provide a performance bond following contract award. Should the ESCO fail to perform through no fault of the facility owner, the bond will cover the completion of performance. A payment bond should also be provided to cover the prompt payment to all others for all furnished labor and materials furnished.

Other typical requirements include bodily injury and property insurance coverage to be carried by the contractor and a general indemnification by the facility owner.

Another type of insurance policy to consider is for a guarantee of energy savings. If the energy savings are to be bonded, the contract should state that this bond is for a one-year period renewable annually on request by the facility in an amount reduced by the energy savings realized in previous years. The surety company may have other requirements for this type of bond.

4.2.9 Trade Names and Patent

Whenever an article of any class or materials or equipment is specified by the trade name of any particular patentee, manufacturer or dealer, or by reference to the catalog of any such manufacturer or dealer, it should be taken to mean and specify the articles or materials described are equal thereto in quality, finish and durability and equally as serviceable for the purpose for which it is or they are intended. The facility owner should make the decision as to whether the material or equipment offered is equal to that specified within the proposal or energy study. The decision of the facility owner should be final.

4.2.10 Patent and Patent Rights

The contractor should protect and hold the facility owner harmless against all claims and actions brought against the facility owner by reason of any actual infringement upon patent rights in any material, process, machine or appliance used by the contractor in the work.

4.2.11 Right of Way

The necessary rights-of-way for any construction to be done across or on private property should be obtained by the facility owner, when feasible. The contractor should take due and proper precautions against any injury to adjacent structures and should hold himself strictly within the rights secured to him by the facility owner in executing the work on private property.

4.2.12 Labor Laws and Ordinances

The contractor should obey and abide by all the laws of the State of South Carolina relating to the employment of labor and public work, and all ordinances and requirements of the facility owner regulating or applying to public improvements.

The contractor should agree not to discriminate against any employee or applicant for employment, to be employed in the performance of the performance contract, with respect to hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of age, sex, race, color, religion, national origin or ancestry. The contractor should further agree that every subcontract entered into for the performance of the contract contain a provision requiring nondiscrimination in employment, as herein specified, binding upon each subcontractor. Breach of this covenant should be regarded as a material breach of the performance contract.

4.2.13 Assignment or Subletting of Performance Contract

In the execution of the performance contract it may be necessary for the contractor to sublet part of the work to others; however, the contractor should not award any work to any subcontractor without prior written approval of the facility owner, which approval should not be given until the contractor submits to the facility owner a written statement concerning the proposed award to the subcontractor. This statement should contain such information as the facility owner may require. Approval should not be unreasonably withheld.

The contractor should be fully responsible to the facility owner for the acts and omissions of subcontractors and of person either directly or indirectly employed by the subcontractors, as well as the acts and omissions of persons directly employed by the contractor. Nothing contained in the performance contract should create any contractual relation between any subcontractor and the facility owner.

The contractor should not assign, transfer, convey or otherwise dispose of the performance contract, or any part hereof, or his/her right, title or interest in the same or any part thereof, without the previous consent of the facility owner. The contractor should not assign by power-of-attorney, or otherwise any of the moneys due or to become due and payable under the performance contract, without the previous written consent of the facility owner.

4.2.14 Workers' Compensation Insurance

The contractor should procure and maintain during the life of the performance contract, Workers' Compensation Insurance in accordance with the workers' compensation requirements of the State of South Carolina, adequately protecting all labor employed by the contractor during the life of the contract and should provide evidence to the facility owner that such insurance is in fact in force. All Certificates for Insurance should be forwarded to the facility owner.

4.2.15 Comprehensive General Liability Insurance

The contractor should procure and maintain in effect during the life of the performance contract Comprehensive General Liability Insurance in an amount not less than $1,000,000 each occurrence and $1,000,000 aggregate for Bodily Injury Liability and $1,000,000 each occurrence for Property Damage Liability. In addition, Comprehensive General Liability Insurance should include coverage for Personal Injury Liability (including employment related suits), Independent Contractors Liability, Blanket Contractual Liability and Products and Completed Operations Liability.

4.2.16 Comprehensive Automobile Liability Insurance

The contractor should procure and maintain in effect during the life of the performance contract Comprehensive Automobile Liability Insurance with residual limits of $1,000,000 each occurrence for Bodily Injury and Property Damage Liability. Such coverage should include Employers Non-Owned and Hired Car Liability and should cover all vehicles owned, leased, operated by or for or on behalf of the contractor.

4.2.17 Indemnification

The contractor should agree to indemnify, defend and hold the facility owner harmless from any and all claims, actions, costs, expenses, damages and liabilities, including reasonable attorney fees, arising out of, connected with or resulting from the negligence or misconduct of contractor or other agents in connection with its activities within the scope of the performance contract, insofar as any such loss or claim is not covered by available insurance proceeds.

4.2.18 Performance and Payment Bond

A Performance Bond and Labor and Material Payment Bond must be a requirement of the successful bidder as contractor per South Carolina State laws.

4.2.19 Compliance With Law and Standard Practices

The contractor should perform it obligations herein in compliance with any and all applicable federal, state, and local laws, rules and regulations, including applicable licensing requirements, in accordance with sound engineering and safety practices, and in compliance with any and all reasonable rules of the facility owner relative to the premises. The contractor should be responsible for obtaining all governmental permits, consents and authorizations as may be required to perform its obligations.

4.2.20 Qualifications

The submission of a proposal should deem permission to the facility owner and to its consultants to make inquiries concerning the contractor and its principals, officers and directors to any persons or firms the facility owner deems appropriate.

4.2.21 Key Personnel

Key personnel assigned to this project by the contractor and its subcontractors should not be removed from this project without the prior written approval of the facility owner. Such approval should not be unreasonably withheld.

4.2.22 Representations and Warranties of Contractor

The contractor should provide the following representations and warrants:

A. The contractor is familiar with all documents appended to the performance contract and with all applicable laws and regulations.

B. The contractor is duly organized, validly existing, presently in good standing and having all necessary powers to enter into the performance contract and to do business in the State of South Carolina.

C. There is no pending or threatened labor dispute, strike or work stoppage affecting the contractors business.

D. There is no suit, action, arbitration or legal, administrative, or other proceeding pending, or to the best knowledge of the contractor, threatened against the contractor that would affect or impair the performance by contractor of the performance contract.

E. The contractor has obtained all registrations, licenses, certificates of inspection, reports, or other clearances required to be obtained of any governmental agency in order to enable it to fully perform the terms of the performance contract.

F. The contractor has the right, power, legal capacity and authority to enter into and perform all its obligations under the performance contract and no approval or consent of any person other than the contractor is necessary to effect the execution and performance of the performance contract by the contractor.

G. There are no other circumstances which would adversely affect the contractor's ability to execute the performance contract and fully perform its obligations.

H. The information in all documents, lists, policies and other writings furnished, or to be furnished, to the facility owner by, or on behalf of, the performance contract is true and accurate and does not fail to include any statement of a material fact, the omission of which would be misleading.

I. None of the representations or warranties made by the contractor, or made in any certificate or memorandum furnished, or to be furnished, to the facility owner by, or on behalf of, the contractor, contains or will contain any untrue statement of a material fact, or omit any material fact, the omission of which would be misleading.

J. The contractor shall, at the contractor's expense, provide the facility owner with such evidence of the accuracy of any and all representations as the facility owner may require. The contractor shall, at contractor's expense, provide the facility owner with such other evidence of contractor's compliance with the terms of the performance contract as the facility owner may require.

5. PROJECT IMPLEMENTATION

5.1 Measuring Energy Savings

5.2 Monitoring and Managing a Performance Contract

5. PROJECT IMPLEMENTATION

5.1 MEASURING ENERGY SAVINGS

5.1.1 Establishing a Baseline

Energy savings can be estimated, but cannot be directly measured. Savings are always a calculated difference between (1) what was actually used and (2) what would have been used if improvements had not been made. The second half of this difference is the energy baseline: "a calculation of each type of energy that would have been consumed in existing facilities, if the Contractor had not installed energy efficiency measures."[2]

Energy baselines can be calculated in different ways depending on what energy efficiency measures (EEM) are being evaluated. A baseline may be created from historical utility billing data, or special purpose metering of existing equipment. The simplest energy baseline is a previous year's utility bills. This is illustrated in Figure 5-1. In this simple example, savings would be calculated simply by the difference between the future usage and the usage in the baseline year. See Figure 5-2.

There are several problems with this type of simplified analysis. In any particular year, various influences will make energy use increase or decrease in unpredictable ways. These irregularities, if incorporated into the baseline, will over- or under-estimate the true savings. This is sometimes addressed by using the average of two or more years to establish the baseline.

Averaging over several years helps reduce random year-to-year variations in the baseline, but will not address long-term trends. For example, if a facility is increasing its hours of use and adding new equipment, a more accurate forecast of future use might show a steady increase. In this case, using a particular year or average of previous years will underestimate the savings. If energy use has been tending to decline due to reduced enrollment, reduced hours of operation, or other efficiency improvements, a historical baseline will over-estimate savings.

[2] Definition of the energy baseline from the model contract.

Figure 5-1: A 12-Month Energy Baseline

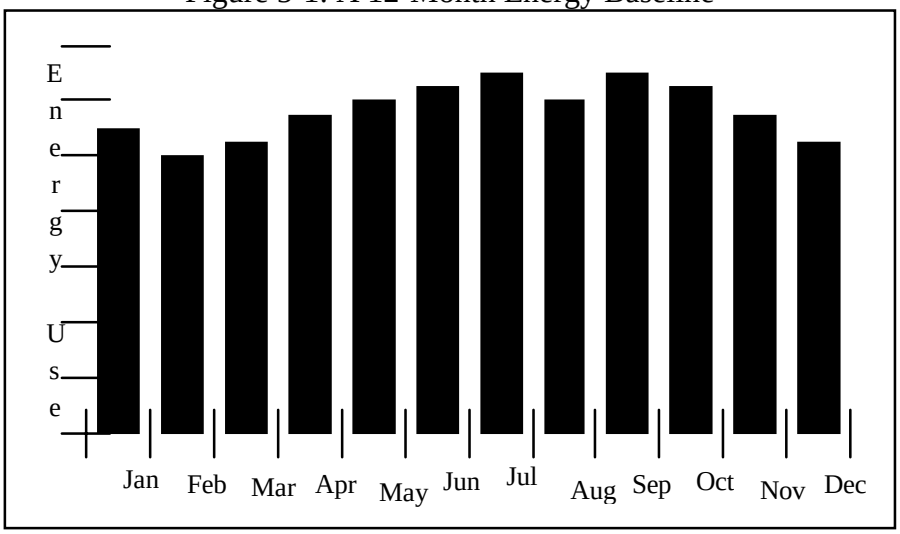
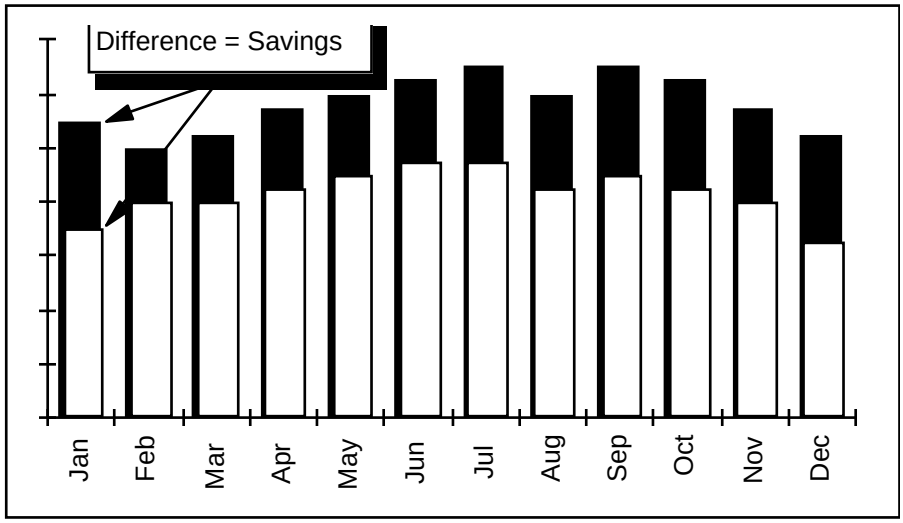


Figure 5-2: Savings Calculated by the Difference between a Baseline and a Subsequent Year



The primary disadvantage of using billing data to measure savings is that it reflects not just the impact of the energy efficiency equipment, but the impact of all changes that have an effect on building energy usage. These include weather, changes in occupancy, addition or removal of equipment, and many others. In order to reliably use billing data as a baseline, we must establish that these other factors have small impacts compared to the efficiency measures or determine a method to adjust for their effect.

One common method to adjust for the impacts of other factors is to develop a computer model of the facility's energy use. The inputs to this model are adjusted until the predicted energy use agrees closely with the historical use. This calibration is intended to ensure that the model is a valid representation of the facility's energy performance.

Then, usually once a year, data on weather, schedule, connected loads, and building area are entered into the model in order to calculate the baseline energy use based on that year's actual operating and weather conditions. A major disadvantage of this method is that because of the opportunity (and incentive) for the contractor to change the model in its favor, the facility staff must become equally knowledgeable about the computer model and its sensitivity to different data inputs. Annually re-computing the baseline creates a regular opportunity for major disputes to arise.

A common alternative approach to overcome these disadvantages is to use end-use or equipment-level metering to establish a baseline. For example, savings from lighting upgrades can be accurately determined by measuring the connected load (in watts or kilowatts) of the existing lighting and the new, upgraded lighting and the operating hours of the lighting after the upgrade. Use caution in determining the actual hours of use. The calculation of baseline energy use is then simply the pre-upgrade kilowatts multiplied by the hours of use after the upgrade. This is shown in the equation below:

$$\textit{Baseline energy use (kilowatt-hours)} = \textit{kilowatts}_{pre} \times \textit{hours of use}$$

The energy use after the retrofit ("post-retrofit") is the new kilowatts multiplied by the hours of use. The equation for the energy use of the new lighting system is:

$$\textit{Post-retrofit energy use (kilowatt-hours)} = \textit{kilowatts}_{post} \times \textit{hours of use}$$

Since the energy savings is the post-retrofit energy use subtracted from the baseline energy use, the equation for the energy savings can be simplified to:

$$\textit{Energy savings} = (\textit{kilowatts}_{pre} - \textit{kilowatts}_{post}) \times \textit{hours of use}$$

In other words, the energy savings is the difference between post-retrofit and "baseline" lighting wattage, multiplied by the light fixtures' hours of use after the retrofit. If usage declines after the lighting upgrade, calculated energy savings will also decline.

In practice, of course, calculation of energy baselines based on equipment metering may be more complex. Only for simple lighting fixture replacements is it this simple. The baseline calculation for other devices, such as air conditioning chillers, fan motors, or chilled water pumps, is fundamentally the same as in this example. In the case of cooling equipment, other variables, such as weather and indoor temperature, may also need to be accounted for. Nevertheless an energy baseline can still be developed based on measurement of the equipment demand under various conditions, and appropriate measurement of operating hours under similar conditions. In most cases involving air conditioning systems, an understanding of the engineering principles basic to refrigeration and fluid dynamics is necessary to fully evaluate the appropriateness of an energy baseline calculation based on equipment metering.

Each of these alternate approaches has advantages and disadvantages. Establishing an energy baseline using billing data is low cost, because the metering and data collection are already being performed. Billing data reflects changes in energy use at a facility, so if many different improvements are implemented in a comprehensive project, a single

measurement evaluates the impact of all of them together, including all of the possible interactions between the improvements. If there are significant changes in energy use that are unrelated to the efficiency improvements, then this all-inclusive feature is also a disadvantage.

Equipment metering has the potential advantage of observing only the change in energy use accomplished by the efficiency improvement. This is usually true for lighting and motor efficiency upgrades. However, for cooling improvements, other influences, such as weather effects and thermostat setpoints, also affect the energy used and must be adjusted for in the baseline calculation. Because metering must be specially installed, read, and calibrated for the duration of the contract, it is more expensive than analysis of utility billing data. Interactive effects between improvements (for example, lighting improvements reduce the amount of cooling required) may be impossible to measure. Contractors will often propose that an estimate of interactive savings be added to the amount measured, but this can result in double-counting.

Table 5-1: Advantages and Disadvantages of Alternate Energy Baseline Calculation Methods

Method	Advantages	Disadvantages
Utility Billing History	• Low cost • Data already available • Independent data • Represents effects of all EEMs • Accounts for interactive effects	• Effects of weather, occupancy, other changes may mask savings • May be unreliable unless savings are large compared to normal bill variations
Equipment Metering	• Isolates effect of EEM • Very accurate for lighting measures • Results are more predictable (lower risk)	• Higher cost • Misses interactive effects

The selection of the appropriate method to calculate the energy baseline depends partially on what energy efficiency measures are finally adopted. The ESCO should identify and propose the methodology for each measure used in its proposal. The proposal will be supported by the energy study. As a result, the facility owner will have the option of reviewing and approving the methodology before the contract is executed.

5.1.2 Modifying the Baseline

As mentioned in part 4.2.7, the use, equipment, or buildings of a facility may change in a manner that makes the previous energy use baseline unrepresentative of the facility. To take an extreme example, reducing a building's operating hours from 60 to 40 hours a week would obviously reduce energy usage significantly. This reduction would not be energy "savings" under the performance contract because the reduction did not result

from equipment installed by the contractor, but from unrelated changes in usage. If the utility bills from a previous year were the baseline for measuring savings, the savings measurement would include not only the actual savings but the savings from reduced operating hours as well. This would be considered a "material change" and should result in a modification of the baseline.

Because conditions change regularly in most facilities, only certain changes should trigger a baseline modification. Changes that are likely to have little or no impact on energy use should be ignored as far as the baseline is concerned. A standard should be established in the contract to clearly define what changes will be considered "material". The standard used in the sample contract is any change "which may reasonably be expected to change the energy consumption of the facility by more than ten percent of the total energy savings." In such an event, the contractor and agency mutually agree on an appropriate modification. If they cannot agree, General Provision 37, "Disputes" would apply.

If "material changes" are listed in the contract, they could include:

- Changes in occupied square footage;
- Changes in operating hours of the facility;
- Changes in the facility's energy equipment or operating parameters other than the ESCO equipment;
- Changes in weather between the base year and guarantee year as measured by daily degree-day comparisons;
- Energy equipment other than ESCO equipment malfunctions, or is repaired or replaced in a manner that increases or decreases energy consumption;
- Other actions taken by facility that may reduce or increase energy use; and
- Discovery of an error in the original baseline; in that case the change would be retroactive.

Changes in the baseline are always made by mutual agreement between the facility and the ESCO.

5.2 MONITORING AND MANAGING A PERFORMANCE CONTRACT

5.2.1 Project Meetings and Reports

Part 2.4, *Organizing a Project Team*, describes the need for a multi-department approach (involving facility's management and planning, procurement, budget, and legal) during project development and contractor selection. After the contract award, the on-site facility administrators, and their consultant (if applicable), are primarily responsible for the day to day oversight of the contractor.

After contract award, a project proceeds in two phases: (1) Construction and Commissioning, and (2) Operation. The key to managing the project is to ensure timely and complete communication between the contractor and facility staff. Meetings held at major project milestones establish a pattern of communication and mutually agreed benchmarks that can then be used to monitor and control the progress of the project. Table 5-2 summarizes major milestones and topics that need to be discussed at each one. Once the contract is awarded, it is easy for the facility staff to focus on regular responsibilities and for the contractor to focus on the current task and forget to keep the facility staff informed. A schedule of regular project meetings helps prevent surprises and keeps the ESCO on track.

Table 5-2: Milestone Meetings

Pre-design meeting
Notice to proceed with design
Design Meeting (1)
Review and evaluate design (i.e. plans and specifications, products, costs)
Design Meeting (2)
Review and approve final drawings
Installation Plans Meeting
Present installation plans
Commissioning, testing and training meeting
Notice of Completion
Plan for acceptance testing of work
Plan for facility personnel training
Plan for installation documentation
Schedule for first year preventive maintenance
Schedule for first year measurement activities
Annual project review meeting
Calculation of energy savings and baseline modifications
Schedule for next year's measurement activities
Schedule for preventive maintenance and training
Occupant complaints, standards of service, etc.

5.2.2 Construction and Commissioning Phase

The construction and commissioning phase of the project requires the most coordination and interaction between the contractor and facility owner. This phase begins with the Notice to Proceed with design of the project.

During this phase, weekly project meetings should be held for the contractor to make status reports. A typical performance contract requires the contractor to submit installation plans for approval before beginning construction. **This is in fact required for state agency and for public school projects**. Standard language for a performance contract also requires contractor submittal of work schedules and notices of utility interruption in advance. These matters would be regularly updated in the weekly meetings.

Management of the design and construction phase of the performance contract is essentially the same as the management of a large design/build retrofit or repair and maintenance project. However, performance contracts incorporate several other elements that are not associated with conventional retrofits. These include training staff, maintaining equipment, monitoring standards of service and comfort, and verifying savings. Unlike construction management, which is completed once the installation has been accepted, these other activities must be monitored for the duration of the contract (often ten years) in order to receive full value from the project.

5.2.3 Annual Monitoring of Savings and Standards of Service

The contractor is required to document in its energy study report "the method of determining energy savings and compliance with Standards of Service annually throughout the contract term." This method should be referred to and checked against a schedule of first year measurement activities that the contractor submits for approval at the commissioning meeting (see Table 5-2). This schedule should include a joint annual inspection of all ESCO-installed equipment to verify that equipment is being operated and maintained as designed. The annual meeting should review the calculation of energy savings for the previous year, including any material changes or modifications of the baseline. At each annual meeting the schedule of measurement activities for the following year should be reviewed and approved.

These annual meetings are not a substitute for ongoing monitoring of maintenance activities or standards of service and comfort or regular auditing of energy-savings' estimates included in ESCO invoices. They supplement these ongoing activities and provide an opportunity for a comprehensive review of the performance of the project on a facility-wide basis. Because they are not in response to an immediate problem, they make it easier to observe trends and longer term facility changes. They also serve as an annual opportunity for facility staff to ask questions and offer suggestions to the contractor regarding how to optimize system performance.

5.2.4 Maintenance Monitoring

One of the benefits of Performance Contracting is that the ESCO has a strong financial interest in ensuring that maintenance is properly performed. Poor maintenance can reduce savings or cause standards of service and comfort to deteriorate below contract requirements. Both of these results are potentially costly to the contractor. A schedule for regular maintenance activities should be established and monitored and comfort complaints should be used as a warning that closer attention may be needed.

Since maintenance responsibilities may be split between the ESCO and the facility owner, equipment for which the contractor has maintenance responsibility should be clearly and prominently marked. This helps prevent inadvertent “takeover” of contractor responsibilities by the facility staff.

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TABLES

List of Abbreviations

CFC	Chlorofluorocarbons
DBEDT	Department of Business, Economic Development, and Tourism
EEM	Energy efficiency measure
ESCO	Energy Service Company
GP	General Provision (of the sample contract)
HAR	Hawaii Administrative Rules
HRS	Hawaii Revised Statutes
kWh	kilowatt-hour
RFP	Request for Proposals
SPB	Simple Pay-Back

Glossary

End-Use	A general category of energy use within buildings, for example, lighting, space cooling, water heating, etc.
Energy Baseline	A calculation of each type of energy that would have been consumed in existing facilities, if the contractor had not installed energy efficiency measures. The baseline is used in the measurement of energy savings from the project.
Energy Efficiency Measure (EEM)	The installation of new equipment, modification of existing equipment, or revised operations or maintenance procedures to reduce energy costs by improving efficiency of use.
Energy Performance Contract	An agreement for the provision of energy services and equipment, including but not limited to building energy conservation enhancing retrofits and alternate energy technologies, in which a private company agrees to finance, design, construct, install, maintain, operate, or manage energy systems or equipment to improve the energy efficiency of, or produce energy in connection with, a facility in exchange for a portion of energy cost savings, lease payments, or specified revenues, and the level of payments is made contingent upon the measured energy cost savings or energy production. (HRS 36-41(b)(l)(d))
Energy Service Company (ESCO)	A private company providing energy management equipment and services including feasibility studies, design, installation, maintenance, and financing. Also referred to as “contractor”.
Guaranteed Savings	A type of performance contract under which the facility pays a lump sum price (usually in monthly installments) for the energy-saving improvements and the contractor guarantees that energy cost savings will equal or exceed this payment.
Municipal Lease	A contract granting use of property during a specified period in exchange for a specified rent. When a public agency is the user of the property, the income from the lease is exempt from income taxes. These tax savings are passed on to the agency by a reduced interest rate.
Priority-Listed Proposer	Those responsive and responsible proposers who are selected for the priority list when numerous proposals are submitted.

Shared Savings	A type of performance contract in which the facility and contractor agree to share the measured energy savings on a pre-determined basis. Under a shared savings contract, the agreement to share savings may be for a fixed time period or until a fixed amount has been paid.
Simple Pay-Back or Pay-Back Period	A measure of project economic effectiveness. The pay-back period is calculated by dividing the initial project cost by the annual project savings.

Appendix A Facility Data Worksheet

Use this worksheet to document basic information needed to evaluate potential for performance contracting and describe the project to proposers. Fill out a copy of the worksheet for each project site (for example, one worksheet for each elementary, intermediate, or high school).

1. Building List

On the attached form titled "Building List" (Table A-1) fill in the information shown below for each building included in the project.

Building Name	Small storage or utility buildings do not need to be included.
Year Built	If a building has additions of different ages, show the year for the portion that is largest.
Gross Floor Area Air Conditioned	In the "Gross Floor Area" column show the total building area. In the "Air Conditioned" column, indicate "Y" or "N" (for yes or no) or put in a percentage to show the percentage of the building that is air conditioned.
Notes	Use this space to describe the use of the building (for example, offices, classrooms, library, etc.) and to describe any special needs or problems relating to lighting or air conditioning.

2. Operating Schedules

Describe the facility's normal operating schedule (for example: "September through June, the facility is partially occupied from 7 a.m. to 9 a.m., and fully occupied from 9 a.m. to 5 p.m., weekdays and partially occupied on Saturday mornings. July through August, the facility is partially occupied (offices only) from 7 a.m. to 9 a.m., weekdays.")

_____
_____
_____
_____
_____
_____

3. Major Changes in Operation, Equipment, or Structures

List major changes to the facility's operation, equipment, or buildings in the last three years that may have significantly affected energy use.

_____
_____
_____
_____
_____

List planned changes to the facility's operation, equipment, or buildings. Identify any equipment scheduled for replacement. Identify any building areas scheduled for remodeling, renovation, or abandonment.

_____
_____
_____
_____
_____

4. Energy Use History

On the attached form titled "Energy Use History" (Table A-2) fill in the blanks for each electric meter or other fuel used at the facility.

5. Energy Efficiency Opportunities

In the space below, list any energy efficiency opportunities that you believe may exist or would like to see evaluated.

_____
_____
_____
_____
_____

In the space below, list any energy efficiency opportunities that have already been implemented.

_____
_____
_____
_____
_____

Table A-1 Building List

Building Name	Year Built	Gross Floor Area	Air-Conditioned Yes or No?	Notes (Principal use and special concerns)

Table A-2 Energy Use History

Facility Name _____ Fuel 1 Supplier _____ Fuel 2 Supplier _____
Electric Utility _____
Account _____ Account _____ Account _____
Meter No. _____ Meter No. _____ Meter No. _____

Period	Electricity Consumption			Fuel 1 Consumption		Fuel 2 Consumption	
				Show units below (e.g., gallons, therms)			
End Date MM/DD/YY	Usage kWh	Usage kW	Cost $$	Usage	Cost $$	Usage	Cost $$
Jan							
Feb							
Mar							
Apr							
May							
Jun							
Jul							
Aug							
Sep							
Oct							
Nov							
Dec							
Total Year 1							
Jan							
Feb							
Mar							
Apr							
May							
Jun							
Jul							
Aug							
Sep							
Oct							
Nov							
Dec							
Total Year 2							

Appendix B Feasibility Analysis Worksheet

Energy savings performance contracts can be used to finance a wide variety of projects and services. However, not all projects or facilities have the right combination of needs and opportunities. Operational or technical barriers may make a performance contract difficult to implement.

Stability of usage is very important to the economics of performance contracts. If past usage is highly variable, developing a baseline is more difficult and savings may be hard to measure. If future usage is uncertain, the projected savings of the energy efficiency measures may be too unreliable to qualify for financing. For example, the possibility of a partial or complete facility closure before the expected end of the contract will make project financing difficult.

Two simple rules of thumb may be used to evaluate whether a facility has adequate potential to attract proposals for a performance contract. (1) Projects with a total cost of less than $50,000 may not be feasible as a performance contract, because the administrative and other fixed costs involved in financing cannot be recovered in a reasonable period of time. (2) The simple payback (SPB) of the project should be five years or less. The simple payback is the project's construction cost divided by its first year savings.

Use this worksheet to identify potential obstacles and opportunities. Remember to consult with other personnel, particularly with respect to plans for future changes. Including representatives of the following functions may be useful:

- Upper management/ administration;
- Facility operation and maintenance;
- Facilities planning;
- Building users;
- Budget and finance; and
- Legal.

1. STABILITY OF OCCUPANCY AND USE

1-1 What changes in facility use, schedule, or occupancy may have significantly changed energy use in the past two years? _____

1-2 Have energy saving measures been installed in the last five years? If yes, list them. _____

1-3 Have any equipment replacement, remodeling, or construction projects been started in the last five years? If yes, describe briefly. _____

2. PLANNED CHANGES

2-1 Are any near-term (next five years) changes in facility use, schedule, or occupancy planned which may significantly affect energy use? _____

2-2 Are any energy efficiency projects currently planned? If yes, please describe. _____

3. HISTORICAL ELECTRICITY USAGE

3-1 Does facility electricity use show a consistent pattern from year to year? Yes_____ No _____
Notes:_____
_____

To decide whether use is consistent, consider the following: Does the total annual use change by less than 15 percent from year to year? Does the maximum monthly use occur in the same season from year to year? If yes, these are indicators of stable usage. Using a computer spreadsheet program to chart use for different years is a good way to visually check whether use is consistent.

4. EVALUATE LIKELIHOOD OF FACILITY CLOSURE

What is the likelihood that some or all of the facility will be closed within the next five years? The next ten years?

Next five years	Next ten years
__ impossible	__ impossible
__ extremely unlikely	__ extremely unlikely
__ not very likely	__ not very likely
__ likely	__ likely
__ certain	__ certain

If you answered “likely” or “certain," what percentage of the facility will be affected?
_____% _____%

5. EVALUATE FACILITY CONDITION

5-1 What is the condition of major energy-using equipment at your facility? This includes lighting and air conditioning equipment. _____

5-2 Has an asbestos survey been completed? Is asbestos present in the facility? If so, where and how extensively? _____

5-3 Are other hazardous materials present (for example, PCBs in fluorescent ballasts)? _____

5-4 Are there significant comfort or reliability problems due to deferred maintenance, equipment age, etc.? _____

6. EVALUATE MANAGEMENT SUPPORT

6-1 Is the concept of performance contracting familiar to personnel who will be involved in or affected by a project? _____

6-2 Who has authority to sign a performance contract? Is this person aware of the possibility of a project and the potential benefits? _____

6-3 What kinds of outside assistance or expertise may be required to complete a performance contract at your facility? _____

Compare your responses to the previous questions to the list of favorable characteristics shown in Table B-1.

TABLE B-1
FAVORABLE CHARACTERISTICS FOR PERFORMANCE CONTRACTING

- Building occupancy and energy use have been stable in recent years.
- Buildings are occupied 3,000 hours per year or more.
- Annual energy costs for the facility (one or more buildings) exceed $50,000 per year.
- No significant changes in occupancy, schedule, or major equipment are anticipated in the near future.
- The facility is unlikely to close or reduce its size or operating hours substantially in the next ten years.
- The facility is in good repair and hazardous materials such as asbestos are not likely to be disturbed by efficiency improvements.
- Facility administrators understand performance contracting and support its use at the facility.

Buildings do not need to have all these characteristics in order to be acceptable candidates. However, if a facility does not have four or more of these characteristics it is a good idea to contact potential qualifiers directly, describe the project, and ask whether they would be likely to provide a Statement of Qualifications if an RFP is issued.

From the potential qualifiers' point of view, the administrative costs to prepare a proposal, organize a project team, and arrange financing are almost the same for a small project as for a large one. As a result, proposers generally have a minimum threshold for the size of a project. Evaluating technical potential helps to ensure that the project potential is large enough to attract responsive proposals. Based on discussions with ESCOs and widely accepted rules of thumb, we believe a project construction cost of $50,000 is the minimum that will attract proposals in Hawaii.

Before beginning a new evaluation of technical potential, review information already on hand regarding energy efficiency opportunities. Energy audits or studies may provide an acceptable evaluation of the facility's technical potential. Review any prior energy studies to make sure that the underlying assumptions about facility occupancy, schedule, structure, and equipment are still valid. Utility rates and construction cost estimates may need to be updated to current levels.

7. REVIEW PREVIOUS ENERGY STUDIES

Collect any previous energy study reports for the facility.

7-1 Review the assumptions (for example occupancy and schedule) of any completed studies. Are they still realistic? _____

7-2 Do the studies furnish estimates of implementation costs and energy cost savings? _____

7-3 Have any of the recommended efficiency improvements already been implemented? If so, please list. _____

7-4 List any other efficiency opportunities documented by other sources (for example, vendor proposals). _____

If the previously completed energy studies (or other sources) document energy savings opportunities (not yet implemented) with a construction cost of $50,000 or more and an overall simple payback of 5 years or less, then performance contracting is likely to be a feasible approach.

If previous energy studies are not available, are out of date, or do not document sufficient potential, the next logical step is to evaluate lighting efficiency opportunities. Lighting improvements are relatively easy to evaluate using a spreadsheet or lighting upgrade analysis program such as *ProjectKalc*.

8. EVALUATE LIGHTING EFFICIENCY OPPORTUNITIES

A complete description of how to evaluate lighting efficiency opportunities is beyond the scope of this Guide. There are many excellent manuals addressing energy-efficient lighting. One of these is the EPA's Green Lights *Lighting Upgrade Manual.* The SCEO can provide assistance in obtaining this and other manuals from the Green Lights program. These materials contain information on current energy efficient lighting technology as well as information on how to estimate the savings and costs associated with lighting upgrades.

The Green Lights program also offers lighting efficiency analysis software such as *ProjectKalc*. It allows the user to compare the energy use and light output of various lighting systems.

9. EVALUATE PROJECT SIZE AND SIMPLE PAYBACK

9-1 Is the total construction cost greater than $50,000? _____

9-2 Is the overall project simple payback less than 5 years? _____

9-3 If the answers to 9-1and 9-2 are NO, can any individual measures be removed in order to make a project for which the answers to 9-1 and 9-2 are both YES? _____

In order for a project to be considered feasible, responses to questions 9-1 and 9-2 above must both be YES. If the project is not large enough, consider "bundling" additional buildings into the project to increase its overall size. If the simple payback is too long, individual measures with longer paybacks can be eliminated, or the facility owner could investigate the possibility of funding part of the project either from utility energy efficiency rebates or from regular construction budgets.